REMARKS

A - AS TO FORM

Drawings

The feature relating to the connection of the two profiled members with the connecting member has been clarified in claim 1. It is now clear that the housing of Figures 15 and 16 is a possible implementation of the connecting member, as assumed by the examiner. Therefore the feature is already present in the drawings.

The feature of the lifetime has been removed from claim 23 and replaced by language corresponding to the description at page 27, line 21 to page 28, line 2.

It is therefore believed that the claimed subject matter is now appropriately supported by the description and drawings.

Claims form

"P" and "D" have been put between parentheses in claim 2.

The language relating to the epicycloids has been made now more appropriate in the description and in claims 5 and 14. The word "shortened" was a literary, but not mathematical translation of the French word. The word "curtate" is believed to be the proper English word. A (simple) epicycloid is the locus of a point on a circle when the circle rolls on another circle, on the external side of the latter. A curtate epicycloid is the locus of a point which is fast with the rolling circle while being situated inside the rolling circle. The curve considered in claim 5 is parallel with a curtate epicycloid.

Claims understanding

Claim 1 requires two profiled members and a connecting member. Each profiled member is in a pivotal relationship with the connecting member about (and not "along", the use of the word "along" was a translator's error) a respective rotation axis O or O'. Hence, both axes are in a fixed position with respect to the connecting member, and the line segment OO' can be considered as symbolizing the connecting member (whose basic function consists in maintaining a fixed distance between O and O'). In operation, at least two of the three members (the two profiled members and the connecting member) must rotate and the third one, not necessarily the connecting member, may remain stationary, or may

be maintained stationary. Each member is in relative movement with respect to the other two members. In the drawings of the application, **except** in Figures 28A - 28F and 29A - 29F, the connecting member is always assumed to be stationary. This can be seen from the fact that the axes O and O' are always in a same position in the drawings (the Examiner's attention is more particularly drawn to FIG 4A - 4F for a better visual perception of the relative movement of the three members).

The fact that the application is however **not** limited to a stationary connecting member appears from the last paragraph of the description, contemplating *i.a.* a case where one of the profiled members is fixed and connected to the housing, whereas the other profiled member performs an orbiting movement, meaning that the connecting member is now typically a kind of crankshaft rotating with respect to the casing about the axis (O or O') of the stationary profiled member (as in a Wankel engine). Moreover, the embodiments of Fig. 28A - 28F and 29A - 29F are illustrated this way, i.e. with the profiled member 61 (Figures 28A - 28F) carrying the profiles 63, 73 and the profiled member 82 (Figures 29A - 29F) carrying the profiles 84, 94 which are both stationary while the other, annular profiled member 62, 81 respectively, orbits therebetween.

The objections regarding claims 2, 23, 30, 31 are believed to be obviously overcome by the amendments made to the claims.

The objection against claim 34 is respectfully traversed. The Examiner is right in her understanding claim 34 as covering *i.a.* the embodiment of Fig 28A-28F. It is however not clear to the applicant why claim 34 would contradict claim 32.

Claim 32 reads on Figs. 28 A - 28F which show a profiled member 61 having an m-lobed profile 73 on a radially outer surface and another m-lobed profile 63 on a radially inner surface. Both profiles have the same pitch circle, see description p. 33, lines 28 - 29, and each cooperates with an (m-1)-lobed profile 74, 64 which has the same pitch circle and is held by the other profiled member, see p. 33, lines 22 - 26.

Once correctly read in view of Figs. 28A - 28F, claim 32 appears as an appropriate basis for claim 34.

The Examiner also objects that the disclosure of the embodiments of Figures 28A - 28F and 29A - 29F is non-enabling for one skilled in the art. This is also traversed. The paragraph bridging pages 33 and 34 of the description clearly states that the profiled member 61 has two m-lobed profiles 63, 73 and is fixed. This is furthermore clearly confirmed by the drawings when

comparing the views between them. Hence, what the Examiner calls the "center profile" is part of profile member 61 and is stationary. As already explained earlier, the machine shaft can be connected to the connecting member and rotate about axis O, which is fixed (because, again, profile member 61 is fixed). All this is obvious for one skilled in the art of conjugate profile machinery having read the whole specification. This invention is not a discovery of the basic operation of conjugate profile machinery, which has been well-known for a long time.

Also the fluid inlets and outlets are not a problem for one skilled in the art. Of course, as assumed by the Examiner, there may be side flanges to close the variable volumes laterally. Inlet and outlet ducts can for example be provided through such flanges. The description states that these machines combine a machine of the first class (63, 64) and a machine of the second class (73, 74), by reference to what is called earlier a machine of the first class (with one more lobe on the inner profile) and a machine of the second class (with one more lobe on the outer profile). One skilled in the art can refer to the fluid distribution solutions proposed for these two kinds of machines, respectively.

ON THE MERITS

A main feature of claim 1 is illustrated in Figure 1: when a contact point (like C2 in Figure 1) of a machine according to the invention coincides with the common tangent T to both pitch circles, the following is observed:

-both surface points forming the contact point have the same continuous curvature with a radius such that the common center of both curvatures is the mutual rolling point R of both circles.

This has the following effect:

-it is well-known that at each instant the relative motion of two solids which are in a mutual rolling relationship is a rotation about the rolling point, i.e. the point R in our case;

-accordingly, in the situation represented in Figure 1, both surface points forming the contact point rotate about R, with respect to each other;

-since R is also the center of curvature of both surface points, and the curvature of both surface points is continuous, the contact is a double contact point, corresponding to a very smooth appearance of a new chamber, or disappearance of a vanishing chamber.

Such a teaching is fully absent from TAYLOR (GB 1 002 642).

According to TAYLOR's FIG. 1 and 3, the inner profiled member has only successive lobe hollow arcs connected together by sharp edges which the reference assimilates to circles with a zero radius, see e.g. page 3 lines 57, 58, but which do not provide a continuous curvature. Similarly, the outer profile member has only lobe dome arcs separated by sharp edges. In the situation represented in Figs. 1 and 3, the sharp edges coincide with each other and with the rolling point at the top of each figure. However due to the discontinuous curvature and the absence of a definite orientation of the contact surfaces with respect to each other and to the rolling point, the double contact point according to the invention cannot exist and is not suggested. There is no mutual sliding of the surfaces at the contact point, neither appearance nor vanishing of a chamber at that point of contact.

According to TAYLOR's FIG. 2, a situation is shown in which a part-circular lobe dome of the inner member is complementarily lodged in a part-circular lobe hollow of the outer member. It is not sure whether contact positions are intersected by the common tangent to both pitch circles at rolling point 10, 40, which tangent is obviously a horizontal line. But two things are sure:

-at such a contact point, should it exist, the contact surfaces are oblique and hence their local curvature cannot be centered on the rolling point;

-the radius of curvature of the surfaces at such a possible contact point is unknown and is apparently much greater than the distance between such a contact point and the rolling point. By contrast, claim 1 requires that the radius of curvature of both contacting surfaces at the contact position be equal to the distance between the contact position and the rolling point (because the curvatures of the contacting surfaces are required to be centered at the rolling point).

The embodiment of Taylor's Figure 2 is described as made of circular profiles which are connected to each other. At the connecting points the curvature is <u>discontinuous</u> because it jumps from a given value about a center inside the profiled member to a given value about a center outside the profiled member. Looking at the drawing, such a point of discontinuous curvature, where the profiles change from concave to convex, could well correspond to the possible contact point contemplated by the Examiner on the tangent to the pitch circles at the rolling point 10, 40. This is contrary to the claimed configuration, which requires a <u>continuous</u> curvature at the contact position which is intersected by said tangent.

Therefore, the configuration recited in claim 1 of the application, is not at all anticipated by any of the embodiments described by TAYLOR.

Incidentally, it is very doubtful that Taylor's embodiments could operate: starting from the situation represented in the drawings, an infinitesimal rolling of the two pitch circles on each other displaces the contact surfaces with respect to the rolling point, but does not displace them with respect to each other otherwise than by a small angle of relative rotation about the represented rolling point. They accordingly remain nested one within the other so that the next infinitesimal movement, during which they are now eccentric with respect to the rolling point, seems to be impossible.

In view of all the foregoing, it is believed that the invention defined in amended claim 1 is neither anticipated nor rendered obvious by TAYLOR.

Furthermore, the Examiner cites GRAY (US 3,884,600) in view of BONAVERA (US 3,117,561) and in view of WANKEL (US 2,988,008) against claim 1 of the application.

According to the Examiner, Figure 18 of Bonavera is relevant as showing a configuration in which the tangent to the pitch circles at the rolling point intersects a contact position of the profiles (Fig. 18).

However:

-the figure gives the impression of a continuous contact all along the upper lobe dome of the inner profile member whereas this is quite impossible, technically speaking: since the surfaces are not circular, further movement would be still more impossible than in previously discussed TAYLOR. The situation would correspond to a strong jam. It is therefore very difficult to know from this small-size figure where the contact point(s) actually lie(s). Perhaps there is only one contact point at the top of the lobe.

-even if it were considered that there is at least one contact position intersected by the common tangent as assumed by the Examiner, this would neither disclose nor suggest that both contact surfaces have identical and continuous curvatures which would be centered on the rolling point.

WANKEL is no more relevant. The contact surface of the triangular rotor is an edge, hence having a zero radius of curvature, which cannot be centred on the rolling point. The curvature is not continuous (because just besides the contact point, the radius of curvature of the triangular rotor is abruptly very different from zero), and is obviously very different from the curvature of the stator surface T at the contact point. The stator curvature at

the contact point is not described as centered on the rolling point.

Even a combination of the three references does not at all suggest the very specific contact configuration defined by claim 1 of this application.

The Examiner also cites BRODOV (RU 2140018) in view of BONAVERA and WANKEL against claim 1 of the application. BRODOV is cited as disclosing the basic elements of a conjugated profile machine. However, in view of the above discussion of BONAVERA and WANKEL, it is clear that these two references will not help a skilled person in converting BRODOV's machine into a machine according to claim 1 of the application.

CONCLUSION: The contact configuration defined in claim 1 of the application is neither disclosed nor suggested by any reference or combination of references of record. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment

to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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